PRACTICAL CASE

Fabric appearance and different ring spinning machine types – a case for Fabric Appearance Index

It is possible that some yarns can produce poor fabric appearance, compared to others using the same raw material and process. How does the unique combination of data from USTER® *QUANTUM 3* and USTER® *TESTER 6* – especially the Fabric Appearance Index – alert the spinner to potential issues?

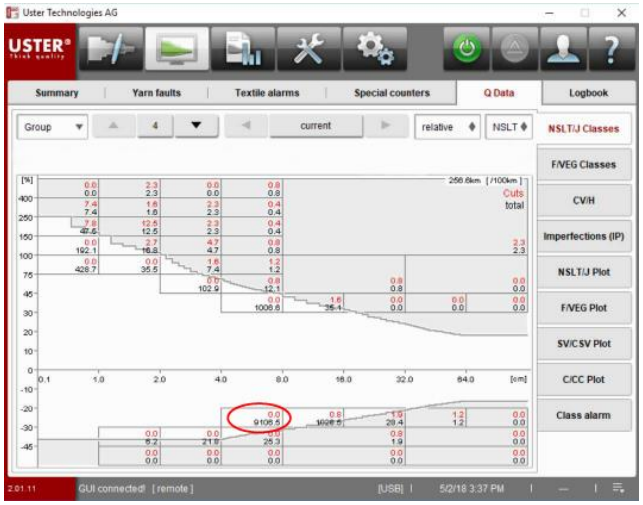
A spinning mill received a complaint about poor fabric appearance, even though the yarn was from the same lot as had already produced satisfactory results.
The spinning mill delivered compact-spun Ne 30 cotton yarn to the weaving customer. After receiving and processing the yarn, the weaving mill noticed that some areas of the fabric showed uneven appearance, spread across the fabric rolls without a pattern. Since it was unusual to see such defects without a pattern, the weaver notified the spinning mill.

USTER solution
The yarn was produced by the spinning mill in the same unit, using the same raw material and spinning preparation process. But the mill was spinning the yarn on three different ring spinning machine types (for production reasons).
Standard quality characteristics, when testing the yarns from the different spinning machine types using USTER® *TESTER 6*, did not show significant differences and were within the normal variation range. (Fig.1)

Values measured by the USTER® *TESTER 6*	**Yarn results from machine type 1**	**Yarn results from machine type 2**	**Yarn results from machine type 3**
CVm (%)	10.56	10.66	10.32
CV10m (%)	2.02	1.67	1.93
-30 % thin places (/km)	289	290	226
-40 % thin places (/km)	5	9	3
-50 % thin places (/km)	0	0	0
+50 % thick places (/km)	2	5	5
+140 % neps (/km)	66	82	63
+200 % neps (/km)	15	18	13
H (-)	5.29	5.45	5.59
S1+2u (/100 m)	17,704	18,074	18,508
S3u (/100 m)	9,032	9,387	9,647
Shape (-)	0.85	0.85	0.85
Density (g/m^3)	0.63	0.62	0.63

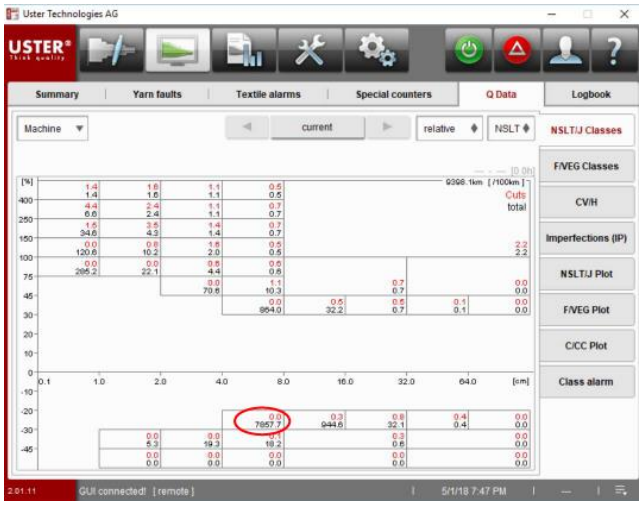
Fig. 1: USTER® *TESTER 6* yarn results from machine type 1, 2 & 3 do not show significant differences.

Analysis of the USTER® *QUANTUM 3* data showed that there were significant differences in the classification of thin places, especially in the additional classes of TD0. (Fig. 2,3 & 4)



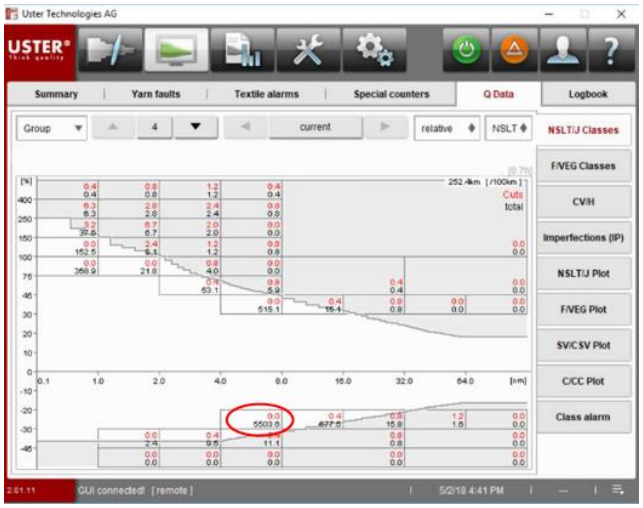
Machine type 1
TD0: 9105.5

Fig. 2: Additional classes of TD0 of machine type 1



Machine type 2
TD0: 7857.7

Fig. 3: Additional classes of TD0 of machine type 2



Machine type 3
TD0: 5500.5

Fig. 4: Additional classes of TD0 of machine type 3

The Fabric Appearance index from the USTER® *TESTER 6* Total Testing Center™ showed that the fabric appearance grading was different for the three yarns. (Fig. 5, 6 & 7)

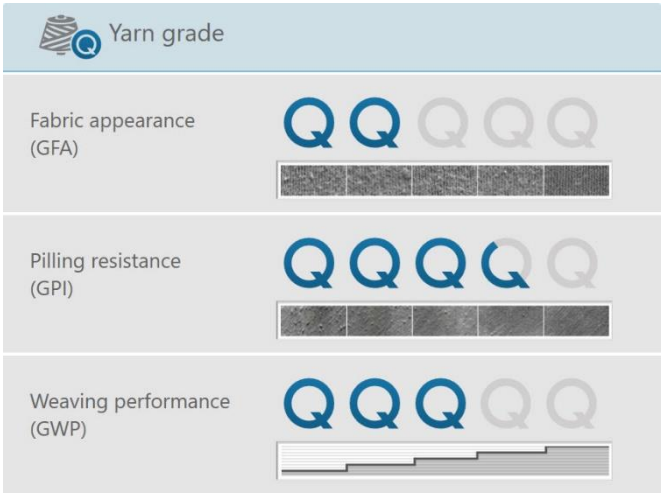


Fig. 5: Fabric appearance index of machine type 1

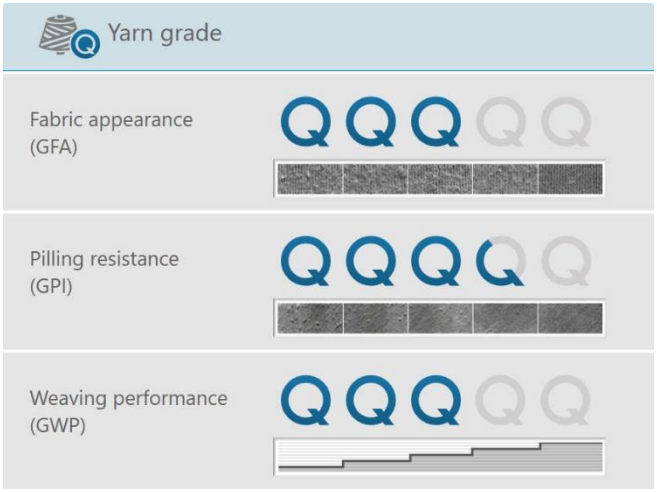


Fig. 6: Fabric appearance index of machine type 2

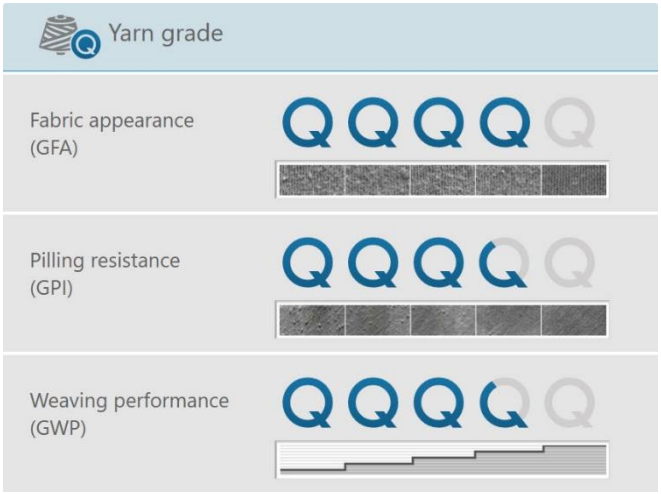


Fig. 7: Fabric appearance index of machine type 3

Conclusion

- The Fabric Appearance Index identified the differences between the yarns, in terms of their potential fabric appearance.
- Although standard testing did not reveal any concerns, the combination of the measured data from USTER® *TESTER 6* and USTER® *QUANTUM 3* pointed to the solution for the user.
- Analysis of the advanced classification from USTER® *QUANTUM 3* revealed a significant difference between the yarns and their details in the classification.
- The spinner decided to stop producing the same yarns using different machine types, to avoid such differences in quality and in the fabric.

Uster Technologies AG
Sonnenbergstrasse 10
8610 Uster
Switzerland
T. +41 43 366 36 36
F. +41 43 366 36 37
sales@uster.com
www.uster.com

USTER®
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